



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,798	08/10/2005	Lin Xiang Sun	0299568-0420-PCT-US	9959
22469 7590 07/10/2008 SCHNADER HARRISON SEGAL & LEWIS, LLP 1600 MARKET STREET SUITE 3600 PHILADELPHIA, PA 19103			EXAMINER SCHEUERMANN, DAVID W	
			ART UNIT 2834	PAPER NUMBER
			MAIL DATE 07/10/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/520,798

Applicant(s)

SUN ET AL.

Examiner

DAVID W. SCHEUERMANN

Art Unit

2834

Period for Reply
-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 4-7, 10 and 24-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8-9, 11-23 and 28-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 January 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3 sheets 6) ☐ Other: _____

DETAILED ACTION

ELECTION/ RESTRICTION

Applicant's election with traverse of Group I, in the replies filed on 6/6/2008 and 4/14/2008 is acknowledged. However with the amendment filed on 4/14/2008 only claims 1, 2, 3, 8-9, 11-23 and 28-33 read on the elected species of Group I. The traversal is on the ground(s) that no serious burden is required. This is not found persuasive because the species are a priori independent or distinct because each of the Species, grouped in the restriction requirement mailed on 3/21/2008, is disclosed as separate and distinct Species, set forth by the Applicant's disclosure. That is, each of the Specie groupings articulated by the associated Figure(s), has been described by the Applicant's specification as being exclusive and distinct from the other Groupings.

Serious Burden

Additionally, each of the various disclosed species have patentably distinct features or characteristics. A search for one of these mutually exclusive characteristics is not coextensive with a search for the other mutually exclusive characteristics and therefore searching for all mutually exclusive characteristics could not be done without serious burden.

Moreover still, the search for one distinctly claimed and mutually exclusive specie, is not required for the other(s).

There is nothing on record, at present, to show that the distinctly grouped species/inventions are obvious variants.

The requirement is still deemed proper and is therefore made FINAL.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the first magnetic air gap and second magnetic air gap must be shown and labeled or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for

Art Unit: 2834

consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 12, 16-18, 20-22 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Imlach, US 5894181. Imlach, US 5894181 shows:

A thrust load enhancement device for a rotor-bearing system, comprising

a stator 22 mounted on a rotation axis of the rotor-bearing system;

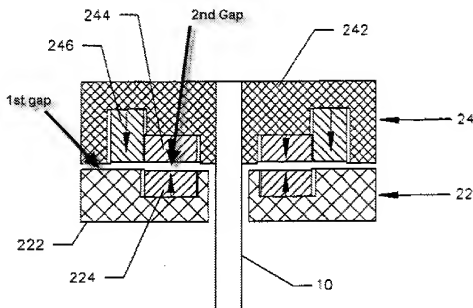
a rotor 24 separated from said stator by a first magnetic air gap on the rotation axis; and

at least one permanent magnet separated from one of: i) said stator and ii) said rotor by a second magnetic air gap; (see figure 2a labeled below)

wherein said at least one permanent magnet, said stator and said rotor form a magnetic circuit characterized by a flux path, a flux in said first and

Art Unit: 2834

second air gaps generating a compensation force between said rotor and said stator that opposes an external force F_{ext} . (inherent since the gaps remain substantially constant)



Re claims 2 and 21, note that shaft 10 of Imlach, US 5894181 is disposed in a vertical orientation therefor the effects of gravitational force is balanced.

Re claims 3 and 22, note that the permanent magnet 224, supra, is separated by 2nd gap.

Claims 12, 16, 17, 18 and 30 recite are limitations related to intended use of the device with no additional structural apparatus limitations or characterizations recited of the device itself. Furthermore, Imlach, US 5894181

shows the rotor being supported in a vertical orientations thus acting against shaft weight.

Claims 1, 20 and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al., JP 404078315A. Tanaka et al., JP 404078315A shows:

A thrust load enhancement device for a rotor-bearing system, comprising
a stator 45A mounted on a rotation axis of the rotor-bearing system;
a rotor 42A separated from said stator by a first magnetic air gap
(B; see figure 1) on the rotation axis; and

at least one permanent magnet separated from one of: i) said stator and
ii) said rotor by a second magnetic air gap;(A; see figure 1)

wherein said at least one permanent magnet, said stator and said rotor
form a magnetic circuit characterized by a flux path, a flux in said first and
second air gaps generating a compensation force between said rotor and said
stator that opposes an external force F_{ext} . (inherent since the gaps remain
substantially constant)

Re claim 33, note hydrodynamic bearing system comprising 23a and 24a.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 8, 9, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imlach, US 5894181 in view of ONO ET AL., US 5360470. Imlach, US 5894181 discloses the invention substantially as claimed as set forth in the rejection of claim 1, supra. Imlach, US 5894181 does not expressly disclose, "...further comprising a spacer to adjust said first and second magnetic air gaps." or "... further comprising a piezoelectric actuator mounted in said stator." ONO ET AL., US 5360470 discloses use of a piezoelectric spacer 70p, for the purpose of adjusting the magnetic gap to ensure efficient operation. At the time the invention was made, it would have

Art Unit: 2834

been obvious to a person of ordinary skill in the art to include an adjustable piezoelectric spacer on the device of Imlach, US 5894181 as taught by ONO ET AL., US 5360470. One of ordinary skill in the art would have been motivated to do this to maintain the efficient operation of the device.

Claims 13, 14, 31, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imlach, US 5894181 in view of JOHNSON ET AL., US 5291975. Imlach, US 5894181 discloses the invention substantially as claimed as set forth in the rejection of claim 1, *supra*. Imlach, US 5894181 does not expressly disclose, "...further comprising force measurement devices to measure the compensation force." or "...wherein said force measurement devices are selected from the group consisting of strain gauges and piezoelectric elements." JOHNSON ET AL., US 5291975 discloses use of a piezoelectric force sensor to control a magnetic bearing, for the purpose of damping vibrations. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to employ piezoelectric force sensor in the device of Imlach, US 5894181. One of ordinary skill in the art would have been motivated to do this to dampen vibrations.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Imlach, US 5894181 in view of GUY, CN 1120256A and THOMAS, US 2782354. Imlach, US 5894181 discloses the invention substantially as claimed as set forth in the rejection of claim 1, *supra*. Imlach, US 5894181 does not expressly disclose, "...wherein said rotor is made of carbon steel and said stator is made of mild steel." GUY, CN 1120256A and

Art Unit: 2834

THOMAS, US 2782354 disclose, respectively the use of a rotor made of carbon steel to reduce costs and use of a mild steel stator to avoid flux crossing laminations see column 2, lines 9-14. Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a suitable and desired material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. See *In Re Leshin*, 125 USPQ 416. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a rotor of carbon steel and a stator of mild steel in the device of Imlach, US 5894181. One of ordinary skill in the art would have been motivated to do this to reduce manufacturing costs and reduce reluctance in the magnetic path.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID W. SCHEUERMANN whose telephone number is (571)272-2035. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Darren Schuberg can be reached at (571) 272-2044. The fax phone numbers for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/D. W. S./
Examiner, Art Unit 2834
July 9, 2008

/Karl I.E. Tamai/
Primary Examiner, Art Unit 2834